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As regards pathogenic action, the germ exposed to desiccation almost always showed a decided slowness in killing the animal.

EFFECT OF SUNLIGHT ON THE PLAGUE BACILLI.

ALBRECHT and BHON (*a*) exposed peritoneal exudate in a test tube (in August, in Vienna), to direct sunlight for six hours, and could not notice any marked difference in the organism.

ABEL (*b*) found that plague bacilli on cover glasses died after one hour exposure to sunlight at 30° C. (in Hamburg). Controls kept in the dark grew after six hours. Thicker spreads from agar cultures withstood sunning at 30° C., three and one-half hours.

KITASATO (*c*) found that the bacillus was killed at Hongkong in three to four hours' sunning. He used pus from buboes.

WILM (*d*) found them destroyed in four hours' exposure to the sun.

THE GERMAN PLAGUE COMMISSION (*e*) made tests in Bombay in this manner: The various objects (glass, silk threads, wool) were saturated with a virulent agar culture of the bacillus pestis. One-half of the objects were exposed to direct sunlight. The other half were laid away in a dark place for control.

In very thin layers on glass the bacillus was killed in one hour.

In thicker layers on glass they were pathogenic for mice after three hours but not after four hours.

In silk threads they were killed after three hours' sunning.

In wool they were virulent for mice after eight hours.

Other tests were made with well grown agar cultures placed in the sunlight. In one or two hours in the sun they still contained active organisms. After a whole day's sunning they were dead. The cultures are warmed very much in the sun; therefore, other tests were made by placing the agar tube in water and kept in the sun one and one-half hours. At the end of the test the temperature of the water was 39° C. The bacillus was alive and virulent.

The following report of the experiments on the viability of the plague bacillus was published by S. L. RAPPOPORT, (*f*) St. Petersburg. The material used was allowed to soak in bouillon cultures of bacillus pestis in a dark closet for twenty four hours, then exposed for successive days to all the sunlight obtainable, or to dry heat.

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[a] Die Peste, Müller and Poch, page 61, Vienna, 1900.

[b] Zur Kenntnis des Pestbacillus. Centralblatt fur Bakteriologie und Parasitenkunde, etc., Bd. XXI, 1897.

[c] Preliminary notice of the bacillus of bubonic plague, Hongkong, 1894, July 7.

[d] Uber die Pestepidemic in Hongkong im Jahre 1896. Hygienische Rundschau, 1897, Bd. VII.

[e] Loc. cit., page 277.

[f] Quoted by Walter Wyman, Surgeon-General Marine-Hospital Service, in "The Bubonic Plague," Treasury Department Document No. 2165.

Temperature and time required to kill.

Material.	20 C. (68 F.)	36 C. (96.8 F.)	60 C. (140 F.)	80 C. (176 F.)
	Days.	*Days.*	*Minutes.*	*Minutes.*
Silk thread	19 to 24	13	75	15
Note paper	10 to 17	5	30	15
Filter paper	10 to 24	7	45	15
Linen thread	9 to 13	4	30	15
Woolen thread	13 to 23	5	60	15

VIABILITY ON VARIOUS OBJECTS.

In sputum kept fluid, the **German Plague Commission**(a) found the bacillus of pest infectious after ten days.

Hankin (b) made researches on various articles of produce to determine their susceptibility to endanger or support the bubonic microbe. He shows that the various descriptions of flours and grain usually stored in Bombay contain no trace of the bubonic microbe and also demonstrates that grain purposely infected does not permit of the existence of the microbe for more than about four days.

Hankin worked with linseed, yellow rape seed, brown rape seed, tilseed or ginjelly seed, ground nuts, castor seeds, poppy seeds, wheat (new hard red), wheat (another light variety), flour.

In order to test whether the microbe was still present in a living condition in a specimen of previously infected grain his method consisted of making an extract of this grain and injecting it into a mouse.

He used agar cultures making bouillon suspensions. About a kilogram of grain to be tested was placed in a sterile stoppered foot glass. One c. c. of the bouillon emulsion of the microbe was then poured into the foot glass, care being taken that it should fall into the center of the grain. The stopper was replaced and the foot glass was immediately violently shaken for about one-quarter of an hour.

Extracts made from the grain in this manner were inoculated into mice with the following results:

Extract of the following injected into mice.	At once after infecting the grain.	Two days after infecting the grain.	Four days after infecting the grain.	Eleven days after infecting the grain.	Thirteen days after infecting the grain.
Linseed	Died within 24 hours.	Died after 7 days.	Died after 15 days.	Survived	Survived.
Yellow rape seed	Died within 72 hours	Died after 24 hours.	Survived	do	Died after 24 hours.
Brown rape seed	Died within 48 hours.	Died after 4 days.	do	Died after 24 hours.	Survived.
Tilseed	Died within 24 hours.	Survived	do	Died after 7 days.	Do.
Ground nuts	do	Died after 11 days.	do	Died after 24 hours.	Do.
Poppy seed	do	Died after 48 hours.	do	do	Do.
Wheat (new hard red).	Died within 48 hours.	Survived	do	do	Do.
Wheat (another kind).	Survived	do	do	do	Do.
Flour	Died within 48 hours	Died after 48 hours.	do	do	Do.

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[a] Kaiserliche Gesundheitsamte, Bd. 16, Berlin, 1899.

[b] The Plague in India, 1896, 1897, Vol. II, Appendices I-IV, page 10 *et seq.*